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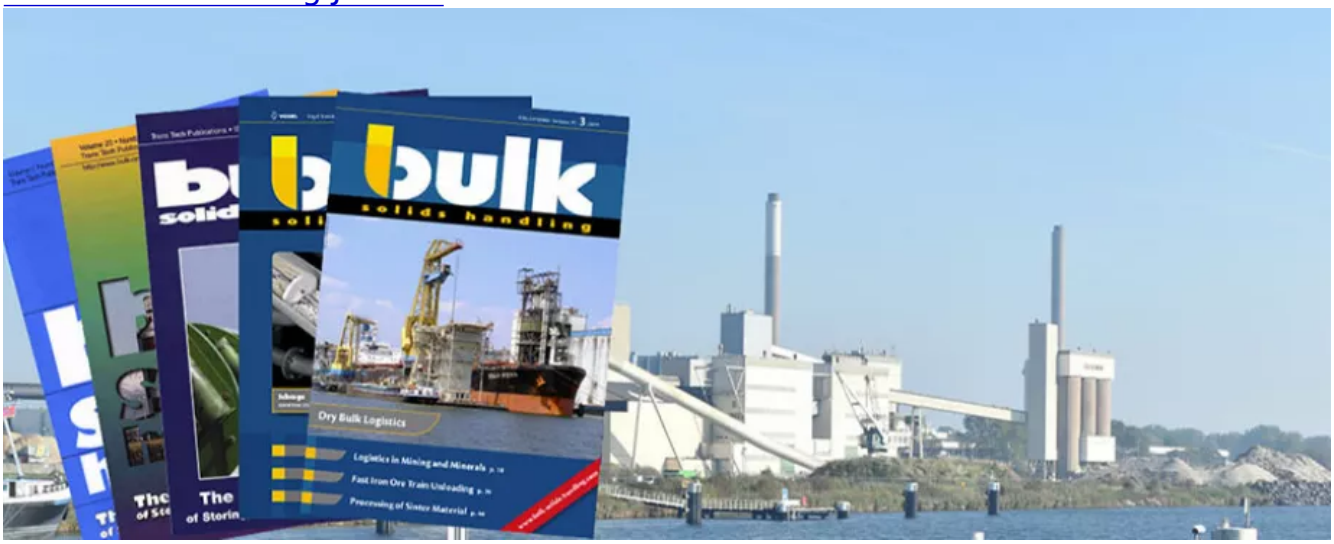

Technical Article

Dredging of Heavy Minerals

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After a short discussion of the mining procedure used for dredging heavy minerals the current dredging techniques are reviewed Successful tun-scale tests proved that an underwater bucket wheel can be applied for dredging purposes up to depths of 100 m and that this bucket wheel shows the same favourable results as bucket wheels used on land-based excavators.

Heavy mineral deposits, called placers, contain a large number of different metals such as gold tin, titanium, and iron. Dredging of these minerals has a long history, the most spectacular example being the gold-rush of the last century.

Mining in the early days was fairly easy because in some areas the deposits forming sand dunes or river banks were easily accessible. Today from a general point of view the placer deposits include a wide range of different soil types with different geotechnical properties. Despite the same origin during the weathering of a primary deposit a variety of transport, settlement and rebuilding processes may occur forming the actual deposit.

There are various classification methods possible for placer deposits, e.g., by gravity or by the transportation and settlement process. With the gravity classification heavy mineral placers such as gold and cassiterite and light mineral placers such as magnetite rutile and ilmenite can be separated.

For the transportation process it is important whether the barren material or only the minerals of value have been removed from the location of the primary deposit.